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YELLOW CEDAR.

Chamaecyparis nootkatensis (Lamb.) Spach.

Of the many species which form the dense forests of Washington and Oregon, yellow cedar is one of the least known. Its valuable wood—light, fine-grained, fairly hard, and exceedingly durable in contact with the soil—makes it a desirable component of the forest.

RANGE AND OCCURRENCE.

Yellow cedar grows in the Pacific coast region from the head of the Santiam River in the Cascade Mountains of northern Oregon northward through Washington, British Columbia, and Alaska to Prince William Sound. South of Mount Rainier it is not sufficiently abundant to be of commercial importance. In Oregon and Washington it is usually confined to the western side of the Cascade Mountains, but occasionally passes over to the eastern slope.

Along the coast of Alaska and British Columbia yellow cedar is found from sea level to an elevation of from 2,000 to 3,000 feet. In Washington and Oregon it is not often found below 2,000 feet, and sometimes reaches an altitude of 7,500 feet. It grows at a lower altitude near the sea than among the inland mountains.

Yellow cedar is most abundant and reaches its best development on the coast and adjacent islands of British Columbia and southern Alaska, where it often predominates in the forest. In Washington small stands covering 30 or 40 acres will sometimes yield as high as 15,000 board feet per acre.

CLIMATE.

The climate within the range of yellow cedar is favorable for tree growth, although at the relatively high altitudes at which this tree is found the growing season is short. The summers are comparatively cool and humid and the winters not severe. The average annual precipitation ranges from 30 to 100 inches or more. The changes in temperature are gradual, although in places the thermometer drops below zero. Near the ocean the climate is particularly mild and uniform, and the humidity and precipitation are especially great.

ASSOCIATED SPECIES.

Yellow cedar occurs scattered through the forest, either singly or in groups. Under favorable conditions it occasionally forms pure stands. Along the coast of British Columbia and southern Alaska, it associates with Sitka spruce, giant arborvitæ, western hemlock, and swamp hardwoods, and grows in a more or less stunted form at timberline with Sitka spruce, black hemlock, and lodgepole pine. On the coast of Washington it also associates with lowland fir and California yew, while at higher elevations, in the coast ranges and Cascades, it associates with black hemlock, lodgepole pine, amabilis and noble firs, Douglas fir, western larch, western white pine, alpine fir, and Engelmann spruce. On the western slope of the Cascade range in northern Washington its chief associates are amabilis fir and black hemlock in the upper part of its altitudinal range, and western hemlock, Douglas fir, giant arborvitæ, and amabilis fir in the lower part.

HABIT.

Yellow cedar has a narrow, conical crown, a rapidly tapering stem set with persistent, horizontal or slightly drooping branches, and flattened, pendent sprays of scale-like foliage. The bark of the young tree is stringy and of a reddish color, but becomes checked and gray with age. The root system is shallow, but less so in dry situations than in wet ones. These characteristics are sufficient to differentiate yellow cedar from all the trees with which it associates except giant arborvitæ. From this species it can be readily distinguished by the greater fineness and delicacy of its foliage sprays, its round, woody cones, and its whiter and less stringy bark.

Yellow cedar is not so large a tree as either giant arborvitæ or western hemlock, but often reaches a height of 120 feet and a diameter of 5 or 6 feet. At high elevations and in dry situations it never grows to a large size and is often very much stunted. In Washington it attains its best form in the lower part of its range, where it sometimes has a clear length of 40 feet. Owing to the shortness of the vegetative season its growth is slow.

The wood of yellow cedar is hard, brittle, close-grained, durable, and fragrant, with yellowish heartwood and white sapwood. It is used in cabinet work, the manufacture of furniture, the interior finishing of houses, and boat and ship building.

SOIL AND MOISTURE.

Yellow cedar requires an abundance of moisture in both air and soil. It is, therefore, chiefly confined to moist situations, and reaches its largest size on bottomlands, along streams, in basins, valleys and gulches, and on moist mountain slopes. In northern Washington it is

commonly crowded out from the bottoms of ravines by *amabilis* fir and is forced to grow on the slopes. Where moisture is deficient it seeks the cooler, northerly exposures, but along the coast where the humidity is great the question of aspect becomes less important, and yellow cedar is also common on the warmer, southerly slopes. It does not need a deep soil, and in regions of abundant rainfall is often found on steep slopes in soil only a few inches deep. Its moisture requirements are very similar to those of giant *arbovitæ*.

TOLERANCE.

Yellow cedar is not so tolerant as western hemlock, giant *arbovitæ*, or *amabilis* fir, but is more tolerant than noble fir, western white pine, or larch. It is more tolerant on moist soils and in the southern part of its range than in dry situations and the northern part of its range. It becomes less tolerant as it increases in age.

REPRODUCTION.

Compared with most of the trees with which it grows, yellow cedar does not reproduce itself abundantly. For this reason it can not compete aggressively with its prolific associates. Flowering takes place in April, and the seeds mature and are scattered in the early fall of the same season. They are light, possess large wings, and are distributed by the wind. Though the seeds will germinate on moss and decaying wood, mineral soil is preferable as a seed bed.

MANAGEMENT.

In the United States yellow cedar grows above the zone of merchantable timber and has as yet been little cut. Though at present it is inaccessible, this species will undoubtedly be in demand in the near future, and the aim in management should be to secure its predominance in the forest of the upper slope type. The quality of its wood makes it a vastly more desirable tree than its most common associates at high altitudes—*amabilis* fir and black hemlock—but it is handicapped in competition with these species by its inferior reproductive capacity and by its slower growth. The obvious remedy would be to promote the removal of hemlock and fir. Since, however, lumbermen can not be expected to cut these inferior species alone, it will be necessary to allow some of the yellow cedar to be taken out with the other species. If only the healthy cedar were retained, even the best stands would probably show after thinning not over one-third the density of normal stands, and good reproduction of cedar could be expected.

Mineral soil should be exposed to aid the germination of the seed. This is always accomplished to some extent in logging. It may further be brought about by piling and burning the brush. On the moist soils which this species requires there is little danger of fire.

The management of yellow cedar should be restricted to high altitudes. Although by vigorous encouragement of yellow cedar and discrimination against its associates its range could doubtless be extended to considerably lower altitudes, such an extension would probably be impracticable, since yellow cedar would have to compete with faster growing species capable of producing good timber in a much shorter time. To produce merchantable yellow cedar and saw timber a rotation of 200 years at least will be necessary. It is therefore probable that yellow cedar will never be a factor in the management of Douglas fir, western hemlock, or giant arbovitæ types of forest.

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